

5

CLAIMS:

1. A method to identify sub-regions of a multi-channel image as containing red-eye comprising:
  - (a) converting said multi-channel image to a modified multi-channel image wherein at least one of said channels is an enhanced luminance channel that has more than 60% of the luminance information of said multi-channel image; and
  - (b) identifying a sub-region of said image as containing a red-eye region based upon, at least in part, processing said enhanced luminance channel.
- 15 2. The method of claim 1 wherein said multi-channel image has red, green, and blue channels.
3. The method of claim 2 wherein said modified multi-channel image has hue, saturation, and intensity channels.
- 20 4. The method of claim 3 wherein saturation is the relative bandwidth of the visible output from a light source.
5. The method of claim 4 wherein said hue is substantially the wavelength within the visible-light spectrum at which the energy output from a source is the greatest.

25

- 5           6. The method of claim 1 wherein each channel of said multi-channel  
image is processed differently to identify said sub-region of said image.
- 10          7. A method to identify sub-regions of a multi-channel image containing  
red-eye comprising:  
             (a) providing said multi-channel image wherein at least one of said channels  
              has more than 60% of the luminance information of said multi-channel  
              image; and  
             (b) identifying a sub-region of said image as containing a red-eye region  
              based upon, at least in part, processing said channel containing said  
              luminance information.
- 15          8. The method of claim 7 wherein said modified multi-channel image has  
hue, saturation, and intensity channels.
- 20          9. The method of claim 8 wherein saturation is the relative bandwidth of  
the visible output from a light source.
- 25          10. The method of claim 9 wherein said hue is substantially the wavelength  
within the visible-light spectrum at which the energy output from a  
source is the greatest.

5           11. The method of claim 7 wherein each channel of said multi-channel  
image is processed differently to identify said sub-region of said image.

10          12. A method to identify sub-regions of a multi-channel image containing  
red-eye comprising:

15          (a) identifying a sub-region of said image as containing a red-eye region  
based upon, at least in part, different processing each of said channels of  
said multi-channel image.

20          13. A method to identify sub-regions of a multi-channel image containing  
red-eye comprising:

- 25          (a) providing said multi-channel image wherein at least one of said channels  
has more than 60% of the luminance information of said multi-channel  
image;
- (b) identifying a sub-region of said image as containing a red-eye region  
based upon, at least in part, processing said channel containing said  
luminance information; and
- (c) identifying said sub-region of said image as containing a red-eye region  
based upon, at least in part, processing another one of said multi-channel  
image.

- 5           14. The method of claim 13 wherein said identifying based upon said  
luminance information includes thresholding said luminance  
information.
- 10          15. The method of claim 14 wherein the result of said thresholding is a first  
mask.
- 15          16. The method of claim 14 wherein the value for said thresholding is based  
upon said image.
- 20          17. The method of claim 15 further comprising reducing the number of  
isolated pixels indicated within said image as a red-eye region.
18. The method of claim 17 further comprising using a convex hull  
technique to identify contiguous regions.
19. The method of claim 18 wherein contiguous regions of insufficient size  
are removed as potential red-eye regions.
- 25          20. A method to identify sub-regions of a multi-channel image containing  
red-eye comprising:

- 5 (a) providing said multi-channel image wherein at least one of said channels substantially includes the hue of said image; and

(b) identifying a sub-region of said image as containing a red-eye region based upon, at least in part, processing said channel that substantially includes said hue.

10

21. The method of claim 20 wherein said red-eye region is based upon identifying a lighter region generally surrounded by a darker region.

15

22. The method of claim 20 wherein said sub-region is identified based upon at least one of (1) its area, (2) its aspect ratio, and (3) its extent.

23. A method to identify sub-regions of a multi-channel image containing red-eye comprising:

(a) providing said multi-channel image wherein at least one of said channels substantially includes the saturation of said image; and

(b) identifying a sub-region of said image as containing a red-eye region based upon, at least in part, processing said channel that substantially includes said saturation.

25

24. The method of claim 23 wherein said re-eye region is based upon identifying location variations in said saturation.

5        25. The method of claim 24 wherein said location variations is based upon a statistical measure.

26. The method of claim 25 wherein said statistical measure is a standard deviation.